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On the whole the definition was very bad. The following measures were taken with great difficulty:—

	h	m	″
Shadow south of axis of ring at	5	45	3·34
		47	3·47
	5	52	4·50
	6	1	2·15
		7	3·43
		14	2·91
	6	17	2·78
Means	6	0·4	3·23

Mr. Lohse observing with the 6-inch Simms made the shadow

		h	m	
	Certainly not up at	5	43	G.M.T.
	Certainly past at	6	2½	
and	Central at	5	53,	

definition very unsatisfactory.

The Observatory, Dun Echt,
Aberdeen, 1877, *Dec.* 26.

On a Cyclonic Arrangement of the Solar Granules.

By W. Huggins, D.C.L., LL.D., F.R.S.

The splendid solar photographs which are taken by Dr. Janssen at Meudon, one of which he has kindly presented to this Society, shows, among other important features, a frequent tendency of the granules to arrange themselves in a spiral form, accompanied by more or less loss of distinctness of outline of the individual granules, an appearance which suggests great

Fig. 1.

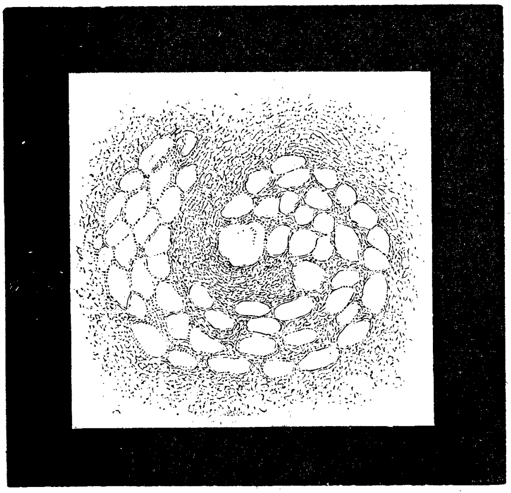
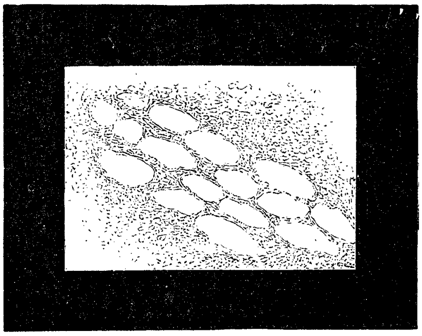


Fig. 2.



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cyclonic disturbances of the part of the solar atmosphere in which these bodies lie. It may be of interest, perhaps, to put on record a similar appearance which was observed in 1866.

The Notes made at the time read thus:—

"Saw distinctly the granules. A spiral band of closely associated granules, ending in one of larger size (fig. 1). In one area near the centre of the Sun's disk, the granules appeared more elongated than usual (fig. 2), rather sparsely scattered, and the larger diameters very nearly in the same direction. In neighbouring areas the granules smaller and less elongated. Amongst these no general direction was observed."

On the Probable Errors of Transits of the First and Second Limbs of the Sun, observed by the Chronographic Method. By A. W. Downing, B.A. (Dublin).

It has always appeared to me, and I believe the impression prevails amongst most persons who are in the habit of constantly observing transits of the Sun, that the transit of the first limb is a more difficult observation than that of the second. This difficulty is occasioned, no doubt, by the fact, that in the case of the first limb the wires of the transit instrument are rendered faint by the glare of the advancing limb, whilst in the case of the second limb they appear as dark lines projected on the bright disk of the Sun as a background, and can be watched with ease during the transit of the limb. It occurred to me then, bearing this circumstance in mind, that it would be a matter of some interest to ascertain if the probable errors of transits of the Sun's first limb were sensibly greater than those of the second, and I accordingly entered upon the investigation, the results of which I have now the honour of laying before the Society. The materials used in the computation were the observations of the Sun made at Greenwich with the transit-circle from 1874, July, to the end of 1875, 100 complete transits having been observed during that time, and the mode of reduction being as follows: The time of transit over each separate wire has been reduced to the central wire by applying to the recorded time the adopted equatoreal interval between the wire and the central wire, corrected for Sun's declination and increase of right ascension in the interval, and thus for each complete transit we have nine "central wires." I then take the mean of these, and find the difference of each from the mean. This being done for each complete observation, we have a number of "apparent errors," from which the probable error is found by the usual formula.

The following Table exhibits the resulting probable errors found by this process, and I have added, for comparison, the results for the transit of a star, given by Mr. Dunkin in the *Monthly Notices*, vol. xxiv., p. 154:—

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